

## Multiplex Sequence Variation Analysis of DNA Samples by Mass Spectrometry

### *Abstract*

The invention relates to the simultaneous analysis of variations in distinct nucleic acid sequences within a complex nucleic acid mixture. The invention consists in the use of chips with spatially separated fields of photocleavable oligonucleotide probes which are commonly processed together with the target sequences and thereby modified in a sequence-dependent way. The probes are cleaved and analyzed by laser desorption mass spectrometry. This allows highly parallel and nevertheless sequence-specific reactions within a single reaction mixture. Since the photocleavable oligonucleotide probes are placed on a substrate in a spatially defined manner, e.g. in the form of an array, a specific target sequence can be assigned a unique position on the oligonucleotide chip. Since the photocleavable probes are covalently immobilized on the solid surface, the detection reaction can be performed directly on the chip while preserving the probe position pattern. Due to the presence of a photosensitive residue within the probes, these can be controlled photolytically after the detection reaction so that a mass spectroscopic analysis can then be carried out.